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11/29/2001

Gordon Kerr

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EXAMINER

NGUYEN, PHUONGCHAU BA

ART UNIT

PAPER NUMBER

2616

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

09/995,707

Applicant(s)

KERR ET AL.

Examiner

Phuongchau Ba Nguyen

Art Unit

2616

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 April 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-37 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-37 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Claim Rejections – 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1–19, 35–36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bell (6,606,666) in view of Vahalia (5,933,603)

Regarding claim 1, Bell teaches an apparatus (figs.1–4) comprising:

at least one stream queue (e.g., buffers 14a–14c, global.control unit 56, and consumer buffer, see FIGS. 1–4 and col.5, lines 31–40) that operates to receive and store a plurality of properly ordered substreams of a data stream (e.g., see col. 2, line 65 – col. 3, line 42 regarding packets of an information flow, inherently comprising proper order in accordance with clock ticks) from a producer (e.g., producer 12) of the data stream; and

a stream queue controller (e.g., control unit 18/32/36), coupled to the at least one stream queue (e.g., buffer 14), that operates to control outputting of at least a portion of the data within the at least one stream queue (e.g., buffer 14) to a consumer (e.g., consumer 16) of the stream queue (e.g., see col. 3, line 43 – col. 4, line 59).

Bell discloses all the claimed limitations, except a stream switch fabric. However, in the same field of endeavor, Vahalia (5,933,603) discloses an ATM switch 53–fig.2 for switching a number of streams (i.e., streams from stream servers 21–26) to appropriate output interfaces (col.6, lines 24–38 & see fig.2). Therefore, it would have been obvious to an artisan to apply Vahalia's teaching to Bell's system with the motivation being to provide streams (i.e., real time video) to users upon demand.

Regarding claim 2, Bell teaches triggering forwarding (e.g., via GRANT/HOLD from control unit 36, see FIG. 2 and col. 4, line 45 – col. 6, line 18) of a copy of at least a portion of the data within the stream queue (e.g.,

buffer 14) to a consumer (e.g., consumer 16) of the stream queue (e.g., buffer 14).

Regarding claim 3, Bell teaches triggering forwarding (e.g., via GRANT/HOLD from control unit 36, see FIG. 2 and col. 4, line 45 – col. 6, line 18) of a copy of at least a portion of the data within the stream queue (e.g., buffer 14) to a consumer (e.g., consumer 16) of the stream queue (e.g., buffer 14) and deleting of this portion of the data within the stream queue (e.g., buffer 14) (e.g., see col. 5, lines 1–5 and col. 7, lines 4–27 regarding sending packets in buffer 14 to consumer 16, inherently comprising deleting the portion from buffer 14 comprising limited capacity).

Regarding claim 4, Bell teaches reading a consumer attribute for the stream queue to determine an assigned consumer of the stream queue and triggering outputting of a portion of the data within the stream queue to the assigned consumer (e.g., see col. 4, line 45 – col. 5, line 13 regarding attributes

of consumer 16 being made known to control unit 18 and factored into grant/hold signal).

Regarding claim 5, Bell teaches selecting a consumer as a consumer for the stream queue based upon a predetermined criteria (e.g., bandwidth criteria) and triggering outputting of a portion of the data within the stream queue to the selected consumer (e.g., see col. 4, line 45 – col. 5, line 13 and col. 8, line 38 – col. 9, line 8 regarding selection based upon bandwidth).

Regarding claim 6, Bell teaches the stream queue controller (e.g., control unit 18/32/36) further operates to receive a control signal (e.g., signal 24/34, see FIG. 2) associated with the at least one stream (e.g., see col. 3, line 43 – col. 20, line 50).

Regarding claim 7, Bell teaches the control signal (e.g., signal 24/34) comprises an indication of at least one consumer attribute (e.g., flow rate, capacity, or consumer output indication) for the at least one stream queue (e.g.,

buffer 14) (e.g., see col. 4, lines 45–59 regarding consumer output indication 34 and col. 5, lines 31–40 regarding control unit 32 managing flow based upon received signaling comprising flow rate and capacity of consumer buffer 16).

Regarding claim 8, Bell teaches the consumer attribute comprises the consumer that is assigned as the consumer of the stream queue (e.g., see col. 4, lines 45–59 regarding consumer output indication 34, inherently comprising the consumer).

Regarding claim 9, Bell teaches the consumer attribute comprises the number of bytes of the data within the stream queue that are to be output to the consumer of the stream queue (e.g., see col. 4, lines 45–59 regarding consumer output indication 34, indicating the number of packets output from consumer buffer, inherently comprising the number of bytes to be output to consumer).

Regarding claim 10, Bell teaches the control signal (e.g., signal 24/34) comprises an instruction to trigger copying of at least a portion of the data within the stream queue (e.g., buffer 14) to the consumer (e.g., consumer 16) of the stream queue (e.g., see col. 4, lines 45–59 regarding consumer output indication 34, indicating the number of packets output from consumer buffer, inherently indicating availability to trigger copying of data stored in buffer 14).

Regarding claim 11, Bell teaches the control signal (e.g., signal 24/34) comprises an instruction to trigger forwarding of at least a portion of the data within the stream queue (e.g., buffer 14) to the consumer (e.g., consumer 16) of the stream queue and deleting of this portion of the data within the stream queue (e.g., see col. 5, lines 1–5 and col. 7, lines 4–27 regarding sending packets in buffer 14 to consumer 16, inherently comprising deleting the portion from buffer 14 comprising limited capacity).

Regarding claim 12, Bell teaches a plurality of stream queues (e.g., buffers 14a–14c and consumer buffer, see FIG. 3 and col. 5, lines 31–40) and

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the control signal (e.g., signal 24/34) comprises an instruction (e.g., see col. 4, lines 45–59 regarding consumer output indication 34, inherently indicating availability to trigger copying of data stored in buffer 14 to consumer buffer at consumer 16) to trigger transferring of at least a portion of the data within the stream queue (e.g., buffer 14) to a second stream queue (e.g., consumer buffer, see col. 5, lines 31–40).

Regarding claim 13, Bell teaches the at least one stream queue comprises a plurality of stream queues (e.g., buffers 14a–14c, global control unit 56, and consumer buffer, see FIG. 3 and col. 5, lines 31–40) and the plurality of stream queues are hierarchical (e.g., see FIGS. 1–4 regarding hierarchy between 14 and 16).

Regarding claim 14, Bell teaches the at least one stream queue (e.g., global control unit 56) comprises at least one register (e.g., see col. 9, lines 15–19 regarding configuration register).

Regarding claim 15, Bell teaches the at least one stream queue comprises at least one buffer (e.g., buffer 14).

Regarding claim 19, Bell teaches an apparatus (figs. 1–4) comprising:

reception means (e.g., via buffers 14a–14c, global control unit 56, and consumer buffer, see FIGS. 1–4 and col. 5, lines 31–40) for receiving a plurality of properly ordered substreams of a data stream (e.g., see col. 2, line 65 – col. 3, line 42 regarding packets of an information flow, inherently comprising proper order in accordance with clock ticks) from a producer (e.g., producer 12) of the data stream;

storage means (e.g., via buffers 14a–14c, global control unit 56, and consumer buffer) for storing substreams; and

control means (e.g., via control unit 18/32/36) for controlling outputting of at least a portion of the data within the means for storing the substreams to a consumer (e.g., consumer 16) of the stream queue (e.g., see col. 3, line 43 – col. 4, line 59).

Bell discloses all the claimed limitations, except a stream switch fabric.

However, in the same field of endeavor, Vahalia (5,933,603) discloses an ATM switch 53-fig.2 for switching a number of streams (i.e., streams from stream servers 21-26) to appropriate output interfaces (col.6, lines 24-38 & see fig.2). Therefore, it would have been obvious to an artisan to apply Vahalia's teaching to Bell's system with the motivation being to provide streams (i.e., real time video) to users upon demand.

Regarding claim 20, Bell teaches the control means comprises copy means (e.g., via GRANT/HOLD from control unit 36, see FIG. 2 and col. 4, line 45 – col. 6, line 18) for copying at least a portion of the data within the means for storing the substreams (e.g., buffer 14) to a consumer (e.g., consumer 16) of the stream queue (e.g., buffer 14) and means for forwarding the copy (e.g., via sending packets to consumer, see col. 5, lines 1-5) of the at least a portion of data.

Regarding claim 35, Bell teaches the predetermined criteria comprises a round robin system (e.g., see col. 8, lines 38-61 regarding round robin).

Regarding claim 36, Bell teaches the predetermined criteria comprises a determination of a least burdened consumer (e.g., see col. 8, line 62 – col. 9, line 8).

Regarding claims 16–18, Bell teaches stream switch fabric discussed above regarding claim 1, however, may not specifically teach the stream queue controller (e.g., control unit 18/32/36) comprises at least one application specific integrated circuit, at least one reduced instruction set processor, or at least one complex instruction set computer processor.

However, Bell also teaches that the invention may utilize an application specific integrated circuit (e.g., see col. 9, lines 29–33 regarding the use of an application specific integrated circuit for an exemplary embodiment of the invention) and further teaches that the invention may be implemented with any other logic hardware, program product hardware, software or any known combination thereof (and see col. 20, line 62 – col. 21, line 19).

Further, Examiner takes official notice that application specific integrated circuits, reduced instruction set processors and complex instruction set

computer processors are well known program product hardware in the art for implementing operations in a stream switch fabric. Thus, at the time of the invention it would have been obvious to one of ordinary skill in the art to implement the stream queue controller of Bell with an application specific integrated circuit, reduced instruction set processor or complex instruction set computer processors since these elements are well known in the art for implementing operations in a stream switch fabric and since Bell specifically discloses utilizing an application specific integrated circuit and also specifically discloses the invention may be implemented with any other logic hardware, program product hardware, software or any known combination thereof.

3. Claims 21–34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bell in view of Almulhem (6,587,431).

Regarding claim 21, Bell teaches a method of processing stream data (figs. 1–4) comprising:

receiving (e.g., via buffers 14a–14c, global control unit 56, and consumer buffer, see FIGS. 1–4 and col. 5, lines 31–40) a plurality of properly ordered

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substreams of a data stream (e.g., see col. 2, line 65 – col. 3, line 42 regarding packets of an information flow, inherently comprising proper order in accordance with clock ticks);

storing the substreams (e.g., via buffers 14a–14c, global control unit 56, and consumer buffer) within a stream queue associated with the data streams; and

outputting (e.g., via control unit 18/32/36) at least a portion of the data within the stream queue to a consumer (e.g., consumer 16) of the stream queue (e.g., see col. 3, line 43 – col. 4, line 59).

Bell discloses all the claimed limitations, except (1) said properly ordered substreams of data comprising data reconstituted from a flow packets.

However, in the same field of endeavor, Almulhem (6,587,431) discloses re-ordering the packets into the proper order utilizing the packet sequence identifiers and output a data stream corresponding to the re-ordered packets, see column 3, lines 40–43 & fig.6, corresponding to (1). Therefore, it would have been obvious to an artisan to apply Almulhem's teaching to Bell's system with the motivation being to cure the mis-ordering of packets in transmission.

Regarding claim 22, Bell teaches the outputting at least a portion of the data within the stream queue to a consumer of the stream queue comprises forwarding (e.g., sending packets to consumer 16, see col. 5, lines 1–5) a copy of at least a portion of the data within the stream queue to a consumer (e.g., consumer 16) of the stream queue (e.g., see col. 4, line 45 – col. 6, line 18).

Regarding claim 23, Bell teaches forwarding (e.g., via GRANT/HOLD from control unit 36, see FIG. 2 and col. 4, line 45 – col. 6, line 18) at least a portion of the data within the stream queue (e.g., buffer 14) to a consumer (e.g., consumer 16) of the stream queue (e.g., buffer 14) and deleting of this portion of the data within the stream queue (e.g., buffer 14) (e.g., see col. 5, lines 1–5 and col. 7, lines 4–27 regarding sending packets in buffer 14 to consumer 16, inherently comprising deleting the portion from buffer 14 comprising limited capacity).

Regarding claim 24, Bell teaches reading a consumer attribute for the stream queue to determine an assigned consumer of the stream queue and

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outputting a portion of the data within the stream queue to the assigned consumer (e.g., see col. 4, line 45 – col. 5, line 13 regarding attributes of consumer 16 being made known to control unit 18 and factored into grant/hold signal).

Regarding claim 25, Bell teaches selecting a consumer as a consumer for the stream queue based upon a predetermined criteria (e.g., bandwidth criteria) and outputting a portion of the data within the stream queue to the selected consumer (e.g., see col. 4, line 45 – col. 5, line 13 and col. 8, line 38 – col. 9, line 8 regarding selection based upon bandwidth).

Regarding claim 26, Bell teaches the predetermined criteria comprises a round robin system (e.g., see col. 8, lines 38–61 regarding round robin).

Regarding claim 27, Bell teaches the predetermined criteria comprises a determination of a least burdened consumer (e.g., see col. 8, line 62 – col. 9, line 8).

Regarding claim 28, Bell teaches receiving a control signal (e.g., signal 24/34, see FIG.2) associated with the stream queue from the consumer of the stream queue (e.g., see col. 3, line 43 – col. 20, line 50).

Regarding claim 29, Bell teaches the control signal (e.g., signal 24/34) comprises an indication of at least one consumer attribute (e.g., flow rate, capacity, or consumer output indication) for the at least one stream queue (e.g., buffer 14) (e.g., see col. 4, lines 45–59 regarding consumer output indication 34 and col. 5, lines 31–40 regarding control unit 32 managing flow based upon received signaling comprising flow rate and capacity of consumer buffer 16).

Regarding claim 30, Bell teaches the consumer attribute comprises the consumer that is assigned as the consumer of the stream queue (e.g., see col. 4, lines 45–59 regarding consumer output indication 34, inherently comprising the consumer).

Regarding claim 31, Bell teaches the consumer attribute comprises the number of bytes of the data within the stream queue that are to be output to the consumer of the stream queue (e.g., see col. 4, lines 45–59 regarding consumer output indication 34, indicating the number of packets output from consumer buffer, inherently comprising the number of bytes to be output to consumer).

Regarding claim 32, Bell teaches the control signal (e.g., signal 24/34) comprises an instruction to copy at least a portion of the data within the stream queue (e.g., buffer 14) to the consumer (e.g., consumer 16) of the stream queue (e.g., see col. 4, lines 45–59 regarding consumer output indication 34, indicating the number of packets output from consumer buffer, inherently indicating availability to trigger copying of data stored in buffer 14).

Regarding claim 33, Bell teaches the control signal (e.g., signal 24/34) comprises an instruction to forward at least a portion of the data within the stream queue (e.g., buffer 14) to the consumer (e.g., consumer 16) of the

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stream queue and delete this portion of the data within the stream queue (e.g., see col. 5, lines 1–5 and col. 7, lines 4–27 regarding sending packets in buffer 14 to consumer 16, inherently comprising deleting the portion from buffer 14 comprising limited capacity).

Regarding claim 34, Bell teaches the control signal (e.g., signal 24/34) comprises an instruction (e.g., see col. 4, lines 45–59 regarding consumer output indication 34, inherently indicating availability to trigger copying of data stored in buffer 14 to consumer buffer at consumer 16) to transfer at least a portion of the data within the stream queue (e.g., buffer 14) to another stream queue (e.g., consumer buffer, see col. 5, lines 31–40).

4. Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bell in view of Vahalia as applied to claim 1 above, and further in view of Almulhem (6,587,431).

Bell discloses all the claimed limitations, except (1) wherein each of the plurality of the properly ordered substreams of data comprises data reconstituted from a flow packets.

However, in the same field of endeavor, Almulhem (6,587,431) discloses re-ordering the packets into the proper order utilizing the packet sequence identifiers and output a data stream corresponding to the re-ordered packets, see column 3, lines 40-43 & fig.6, corresponding to (1). Therefore, it would have been obvious to an artisan to apply Almulhem's teaching to Bell's system with the motivation being to cure the mis-ordering of packets in transmission.

Response to Arguments

5. Applicant's arguments filed 4-4-07 have been fully considered but they are not persuasive.

A/. Applicant argued that Valhalia and Bell are not in the same field of endeavor.

In reply, applicant is directed to Bell's abstract disclosing the control unit output a grant message to the producer indicating that the producer is

permitted to output a packet. While Vahalia discloses a video file server (see abstract) including a server controller for applying an admission policy to client requests and assign stream servers to service the client requests. Both systems are in the same field of endeavor of admission control.

B/. Applicant argued that there is no motivation, thus hindsight analysis based on the present application.

In reply, both systems are in the same field of endeavor of admission control. In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

C/. Applicant argued that Vahalia and Bell do not teach in combination a stream switch fabric.

In reply, applicant is directed to figure 2 wherein the switch 53 is the stream switch fabric for permitting any client 54 to communicate with any stream server 21 to request stream services, (see abstract) thus the video file server assigns stream servers 32 to service the client requests, in other word, video file server provides video on demand (i.e., stream) service by allocating video data of the stream servers to the clients.

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phuongchau Ba Nguyen whose telephone number is 571-272-3148. The examiner can normally be reached on Monday-Friday from 10:00 a.m. to 6:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu can be reached on 571-272-3155. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Phuongchau Ba Nguyen
Examiner
Art Unit 2616



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